IP ADDRESSES

At the IP level, packets are sent from one IP address to another. Every computer connected to an IP network has one or more IP addresses. For the purpose of this series we will be ignoring IPv6, so IP addresses are of the form **n1.n2.n3.n4**, where**n1** to **n4** are numbers between 0 and 255,

E.g. **192.168.0.1**.

Unlike MAC addresses, IP addresses are not hard-coded into our network interfaces. Instead, they have to be configured within the operating system. Historically this was always a manual process, but today it's usually automated using the *Dynamic Host Configuration Protocol*, or DHCP. We'll be looking at how DHCP works in detail later in the series. Also, a single network interface can have many IP addresses assigned to it, and a single computer can have many network interfaces, so it's not uncommon for a computer to have multiple IP addresses.

The vast address-space of possible IP addresses is managed by the *Internet Corporation for Assigned Names and Numbers* (ICANN). ICANN assign blocks of IP addresses to organizations.

There are also three special blocks of IP addresses that ICANN have reserved for use on private networks, and it's these IPs that we use within our homes. These private IP addresses can never appear on the public internet, they must always be either completely disconnected from the internet, or isolated from the internet by a NAT router. We'll look at NAT in more detail later, but for now all we need to know is that just about every home router is a NAT router.

The private IP address ranges:

- **10.0.0.0** to **10.255.255.255** (in common use)
- **172.16.0.0** to **172.31.255.255** (rarely seen)
- **192.168.0.0** to **192.168.255.255** (in very common use)

Additionally, there are two other special ranges of IPs you may encounter:

- **127.0.0.0** to **127.255.255.255** – the range reserved for so-called *loop-back traffic* within a computer
- **169.254.0.0** to **169.254.255.255** – the range reserved for self-assigned IP addresses – if you see one of these on your computer, it almost always means something has gone wrong!

Source: https://www.bartbusschots.ie/s/2014/12/07/taming-the-terminal-part-25-of-n-ip-subnets/